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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/547,561

04/12/2000

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P98-US

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10/31/2006

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EXAMINER

GILMAN, ALEXANDER

ART UNIT

PAPER NUMBER

.2833

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/547,561

Applicant(s)

MATHIEU ET AL.

Examiner

Alexander D. Gilman

Art Unit

2833

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 and 83-92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 83-92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/13/05 ✓
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 5-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 5-7 disclose increasing or decreasing in volume of the material. It is unclear from the specification (p. 27, lines 10-19) why depending on overlying or underlying the first material by the second material a volume of the second material would increase or decrease.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 16, 17, 90, 91 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16, 17, 90, 91 recite "element material changes a shape to a previously defined shape in response to the external stimulus".

The phrase is unclear, since a term "change" means "became different". To change a shape to a previously defined shape should be interpreted as no change. Also, it is unclear how to interpret a term "previously defined shape" (before or after being transformed?).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8-11, 14, 15, 18, 19, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al.

With regard to claims 1-3, 8, Smith et al (US Pat. 5,613,861) disclose (Fig. 13)

the interconnection element (15) comprises:

a first element material (11) adapted to be coupled to a substrate, and

a second different element material (19) coupled to the first element material, (col. 4, lines 42-44); such that while the second end of the first element material is released from

the substrate, the interconnection element has a first geometric shape before application of the external stimulus and a second geometric shape after application of the external stimulus, and the second geometric shape is different than the first geometric shape.

With regard to claims 9, 11, Smith et al (US Pat. 5,613,861) disclose the second element is introduced by plating and more specifically electroless plating (col. 6, lines 36-39 and col. 8, lines 61-62).

With regard to claim 10, Smith et al (US Pat. 5,613,861) disclose the second element is introduced by sputtering (col. 6, lines 39-40).

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With regard to claims 14, 15, , Smith et al (US Pat. 5,613,861) disclose the second element comprises nickel or nickel alloy (col. 4, lines 44-46).

With regard to claim 18, Smith et al (US Pat. 5,613,861) disclose that the external stimulus reduces the magnitude of the stress of the material (col. 5, lines 19-21).

With regard to claims 19, 21, Smith et al (US Pat. 5,613,861) disclose that the element material has tensile and compressive stress and a deformation is a response to these stresses (col. 5, lines 11-21).

Also, Claims 1-15, 18- 21, 83-92 are rejected under 35 U.S.C. 102(b) as being anticipated by WO/99/14404 (inventor - Chen et al).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 4-7, 20, are as claims 5-7, 90,91 can be understood due to the 112 problem, rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of WO/99/14404 (inventor - Chen et al).

With regard to claims 4-7 Smith et al do not disclose changing a volume of the second element material in response to heat

Chen et al (claims 67-71 ) disclose changing in structure of the material, which according to the current specification, (p. 23, lines 5-10) causes change in material volume.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a heat treatment of the deposited second material, as taught by Chen et al, to improve the interconnect's mechanical properties.( Chen et al, Abstract).

With regard to claim 20 Chen et al disclose (Abstract) using heat for reducing an inherent stress.

2. Claims 12, 13, are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Eldridge et al.

Smith et al disclose all of the limitations except for the first element material comprising palladium or its alloy.

Eldridge et al (US Pat. No. 5,832,601) disclose the first element material comprising palladium or its alloy (col. 14, lines 6-10).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Smith et al interconnection element comprising palladium or its alloy, as taught by Eldridge et al, as an alternative material for the first element.

Claims 83-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 5,613,861) in view of Smith (US 5,979,892)

Smith et al (US Pat. 5,613,861) does not explicitly disclose that the interconnection element has an overall thickness greater than 1 micron, specifically 25 micronm 28 micron, and the thickness of the first element being 1-3, 5, 12-25 microns and second element has a thickness 3-6 micron.

Smith (US 5,979,892) disclose (col. 5, lines 30-38) that interconnect formed using microlithography can be formed into almost desired shape and the configuratuion of the interconnect should not construed as limiting invention.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to assign to the interconnect any of the specified configuration, as taught by Smith (US 5,979,892), to achieve the desired elastic and geometrical characteristics.

It was held that, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. In re Swain et al., 33 CCPA (Patents) 1250, 156 F. 2d 239, 70 USPQ 412.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 4, 6, 8, 12, 13, 16 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

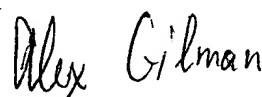
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander D. Gilman whose telephone number is 571 272-2004. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571 272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/12/06



**ALEXANDER GILMAN  
PRIMARY EXAMINER**